

## **The DARPA/Army Unmanned Combat Armed Rotorcraft (UCAR) Program Fact Sheet**

The goal of the joint DARPA/Army UCAR program is to demonstrate the technical feasibility, military utility, operational value and affordability of a UCAR system as part of the Army Future Force structure. The UCAR program is exploring the capability to effectively and affordably perform armed reconnaissance and attack missions within the post-2010 system-of-systems environment.

The UCAR weapons system will transform the post 2010 battlespace as an integral part of the Army Future Force system-of-systems architecture. UCAR systems will augment the ground maneuver and manned aviation forces as an autonomous system or as an element of manned/unmanned teams. UCAR will employ the next level of autonomy for unmanned systems, autonomously planning, dynamically re-planning and executing lethal combat missions with minimal man-in-the-loop workload requirements. UCAR controllers will provide mission tasking and constraints, implement rules of engagement, and provide weapons release authorization. UCAR will enable the vision of manned-unmanned teams that leverage the capabilities of both man and machine, will function as a cost effective force multiplier, and will enhance the mobility, lethality, survivability, and sustainability of the Future Force.

The specific objectives of the UCAR program include:

- Development and demonstration of:
  - an effective, low total ownership cost design for the UCAR system
  - an air and ground-based distributed mission control capability
  - autonomous multi-ship cooperation and collaboration
  - autonomous low altitude flight
  - UCAR system survivability
- Demonstration of:
  - manned-unmanned teaming
  - the target engagement sequence, including detection, identification, weapons delivery, and target damage assessment with human-in-the-loop weapons release authority
- Demonstration and evaluation of UCAR operational effectiveness
- Maturation of the UCAR system to Technical Readiness Level (TRL) sufficient for a Milestone B decision and entry into SDD not later than FY10

The UCAR program is being conducted in four phases. During Phase I, four contractor teams were awarded Other Transaction for Prototype Agreements for Conceptual Design and System Trades. Phase I began in May 2002 and provided \$3 million to each contractor for the initial 12-month concept development and system trades phase. In Phase II, the program down selected to two contractor teams – Lockheed Martin and Northrop Grumman – for Preliminary Design, with awards of approximately \$10 million each in July 2003. In Phase III, the program will further down select to one contractor team for System Demonstration and that contractor team can be continued into Phase IV for System Maturation.

The program is focused on developing and maturing key technologies in the areas of autonomous operation and collaborative team execution, low altitude autonomous flight, survivability, and targeting of camouflaged and concealed threats. To reduce risk and increase technical readiness levels, the UCAR program conducted numerous risk reduction activities in Phase II. These included Manned Unmanned (MUM) teaming demonstrations in which each contractor team demonstrated the technical approach for UCAR autonomous decision making and collaborative operations in a simulation environment, collaboration with manned assets, an efficient man-machine interface, command and control concepts, and linkage to off-board sources of information. Other demonstrations included the fabrication and testing of full-scale survivability demonstrators, a physics-based digital simulation of the UCAR obstacle avoidance system, targeting using a surrogate sensor suite that demonstrates the capability to differentiate combatants from non-combatants at standoff range, subscale wind tunnel models, and a number of additional demonstrations from each team. The above demonstrations have advanced the level of maturity of these key technologies and provided data for the Phase III downselect decision that is planned for October 04.

In Phase III, the winning team will fabricate two 'A' model demonstrator systems, mature and demonstrate key technologies, and reduce the risk of achieving key system attributes. In Phase IV, a 'B' model fieldable prototype will be developed and demonstrated in an operational environment. The UCAR system as a whole will be matured to a Technology Readiness Level of 7 and transitioned to the Army for a Milestone B decision at the end of FY09. By using the 'B' model as the basis for a first spiral of operational capability, the Army could begin to field UCAR in the 2012 timeframe.

As of September 20, 2004.